

REMARKS

Claims 1-47 are all the claims pending in the application. Applicant thanks the Examiner for indicating that claims 23-47 are allowed. Applicant also thanks the Examiner for indicating that claims 4-11, 16, and 18-20 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 4 and 7 have been so rewritten herewith. Claims 1-3, 12-15, 17, 21, and 22 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Fujimoto et al. (U.S. Patent No.: 6,711,372) in view of Noda et al. (U.S. Patent No.: 6,243,542).

With respect to independent claim 1, Applicants amend this claim for clarification purposes, as indicated herein, and submits that the applied references, either alone or in combination, do not teach or suggest at least the combination of limitations “a cleaner which removes toner remaining on said image carrier” and “that prior to formation of said patch image, idling of said toner carrier is executed which requires rotation of said toner carrier at least one round or more,” as recited in claim 1. That is, according to the present invention, a cleaner is provided in order to remove toner from an image carrier. In addition, as described in the specification, “idling” of the present invention means, for example, making a toner carrier rotate at least one round or more prior to formation of an image. This eliminates the lack of the uniformity of a toner layer on the toner carrier prior to image formation and hence prevents density variation in an image attributed to shutdown-induced banding. On the other hand, the apparatus of Noda does not have any structures that remove the toner remaining on an image carrier (1). In an apparatus having such a cleanerless structure (Noda), the toner remaining on the image carrier is generally recovered by making the toner re-adhere to a developing roller.

According to Noda, a developing roller (4) mainly takes part in cleaning during "idling" between image formation processes (column 7, lines 25-31). Further, during "idling", the bias voltages are applied to the image carrier (1) and the developing roller (4) so that the toner moves from the image carrier (1) toward the developing roller (4) (column 14, "EXAMPLE 5"). Based on the reasons set forth above, it is obvious that the "idling" in the cited reference pertains to the cleaning operation for the image carrier in the image forming apparatus having the cleanerless structure. Therefore, the applied references, either alone or in combination, do not teach or suggest the combination of features set forth in claim 1, including "a cleaner which removes toner remaining on said image carrier" and "that prior to formation of said patch image, idling of said toner carrier is executed which requires rotation of said toner carrier at least one round or more". Also, Applicants submit that it is impossible for the structure of the cited references to achieve the effects of the present invention.

Thus, the "idling" in the present invention is completely different from the "idling" in the cited reference. Moreover, since the present invention contains its own specific structures and effects, it could hardly be said that the present invention can be easily achieved by the two cited references (Noda et al., Fujimoto et al.), either alone or in combination.

Applicants submit that dependent claims 2, 3, 5, 6, and 8-13 are patentable at least by virtue of their indirect or direct dependency from independent claim 1.

With respect to independent claim 14, Applicant amends this claim, as indicated herein, and submits that this claim is patentable at least for reasons similar to those set forth above with respect to claim 1.

With respect to independent claim 15, Applicants amend this claim, as indicated herein, and submits that the applied references, either alone or in combination, do not teach or suggest at least “a timer which measures an elapsed time since an end of formation of a toner image by said image forming means” and “in the event that said image formation request is not newly received after said elapsed time measured by said timer has reached a first predetermined period, said optimization is executed,” as recited in amended claim 15. That is, according to the present invention, a timer is provided for measuring the elapsed time since the end of image formation. When the elapsed time measured by the timer has reached a predetermined period, optimization is executed. Therefore, according to the image forming apparatus of the present invention, some kind of image is formed with or without the request for image formation from an external source, prior to the predetermined period that has elapsed since the end of a preceding image formation. Accordingly, an operation-suspended state, where an image formation is not executed, never lasts over the predetermined period, and hence the density variation in an image attributed to the shutdown-induced banding is prevented.

On the other hand, the image forming apparatuses of the cited references (Noda et al., Fujimoto et al.) do not have this kind of timer, and obviously the technical idea of starting the optimization based on the results measured by the timer does not exist in the applied references. Specifically, Noda et al. never even describes such optimization. In Fujimoto et al., the optimization is executed just before the image forming operation, and it never considers how much time has elapsed since the end of a preceding image formation. Therefore, at least based on the foregoing, Applicants submit that the applied references, either alone or in combination, do not satisfy the above-quoted limitations of claim 15.

Applicants submit that dependent claims 16-22 are patentable at least by virtue of their indirect or direct dependency from independent claim 15.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

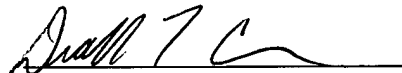
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WASHINGTON OFFICE

23373

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AMENDMENT UNDER 37 C.F.R. §1.111
U. S. Application No. 10/622,193

ATTORNEY DOCKET NO. Q76031

AMENDMENTS TO THE DRAWINGS

Submitted herewith please find 17 sheets of proposed drawing corrections with the changes indicated in red ink. The Examiner is respectfully requested to acknowledge receipt of the drawing corrections and approve the changes.

Attachment: 17 sheets of Annotated Marked-Up Drawings